MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting & Compliance Division

RECORD OF DECISION

for

Golden Sunlight Mine Permit Amendment 011
to Operating Permit 00065
Jefferson County, Montana
August 17, 2007

I. Introduction and Background

Golden Sunlight Mines, Inc. (GSM) mines and processes gold-bearing ore on public and private lands approximately 5 miles northeast of Whitehall, Montana. Modern mining within this historic mining district began in the 1970s with exploration and predevelopment activities culminating in GSM receiving Operating Permit No. 00065 on June 27, 1975. An environmental impact statement (EIS) was prepared in 1981 for a major expansion of the mine that led to construction of the open pit, mill, Tailings Impoundment No. 1, and a cyanide vat leach facility. The operating permit has been revised and amended numerous times since.

The Montana Department of Environmental Quality (DEQ) and the Bureau of Land Management (BLM)[1] authorized Amendment 010, which extended the life of active mining through Stage 5B, on July 9, 1998. The Draft EIS (DEIS) for that amendment was completed in November 1997. The Final EIS (FEIS) was completed in April 1998, and the Record of Decision (ROD) was signed in June 1998.

In the 1998 ROD, DEQ applied the factors set forth in the Legislature's uncodified statement of intent for Chapter 464, Laws of 1995, and selected the No Pit Pond Alternative for reclamation of the pit. A lawsuit was filed in the Montana First Judicial District Court, Lewis and Clark County (District Court). In its February 16, 2000, Memorandum and Order Decision, the District Court found that DEQ erred by relying on the factors in the statement of intent. In addition, the District Court construed the Metal Mine Reclamation Act (MMRA) as requiring partial pit backfill. Finally, the District Court determined that the failure to impose the partial pit backfill, which it characterized as providing the most comprehensive reclamation, contravened the constitutional requirement that all mined lands be reclaimed. As the District Court stated, "Today, the record before the Court reveals that the major environmental and reclamation concerns at Golden Sunlight Mine, specifically, the open pit and the highwall, are best capable of being reclaimed by means of the partial pit backfill alternative. In addition, the record

[1] BLM has the responsibility and authority to manage the surface and subsurface resources on public lands. Virtually all of the West Waste Rock Dump and portions of the pit and East Waste Rock dump are BLM-managed federal lands. BLM will be issuing a separate Record of Decision documenting its decisions regarding reclamation of the open pit at GSM.

shows that partial pit backfill reclamation will provide comparable utility and stability with other disturbed lands. Furthermore, partially backfilling the pit can significantly reduce acid mine drainage."

In 2000, the Legislature amended the reclamation standards for open pits and rock faces, prohibiting backfill except and to the extent necessary to meet state air and water quality standards. In November of 2000, DEQ determined that the No Pit Pond Alternative complied with the amended reclamation standards based on the environmental impact analysis set forth in the 1997 DEIS. The decision was again challenged.

In March of 2002, the District Court ruled that the 2000 amendments to MMRA were unconstitutional because in most instances they prohibited imposition of partial pit backfill, which the District Court deemed to be an effective reclamation tool. In its ruling, the District Court repeated the language from the February 2000 ruling cited above and stated "that record has not changed." On June 27, 2002, the District Court ordered DEQ to immediately begin implementation of the partial pit backfill reclamation plan at GSM in accordance with the procedures set forth in MMRA. DEQ and GSM appealed the District Court's decision to the Montana Supreme Court.

Pursuant to the June 27, 2002, ruling, DEQ subsequently ordered GSM to submit a revised partial pit backfill plan meeting the requirements of MMRA, its implementing rules, and the district court judgment. A revised partial pit backfill plan was necessary because the conditions of the mine were not the same as those projected in the 1997 DEIS. In addition, GSM had provided affidavits of a geologist, a hydrologist, and an engineer indicating the partial pit backfill may result in water quality degradation. Thus, the revised partial pit backfill plan was required to take into consideration current conditions at the mine site and address compliance with the Montana Water Quality Act. GSM submitted a proposed partial pit backfill plan on December 2, 2002.

DEQ and the BLM subsequently determined that it was necessary to prepare a Supplemental Environmental Impact Statement (SEIS) on the revised partial pit backfill plan. Under state law, an SEIS is required whenever there is a substantial change in the proposed action (such as the revisions to the partial backfill plan caused by changed conditions at the mine) or there is significant new information discovered prior to the final agency action (such as the information regarding water quality degradation provided by GSM) that bears on the impacts of the decision and that changes the basis of the decision. In addition, BLM notified DEQ that partial pit backfill may result in unnecessary or undue degradation and that, before GSM could be required to reclaim federal land pursuant to a partial pit backfill alternative, the BLM must prepare a supplemental review under the National Environmental Policy Act. The Montana Supreme Court has held DEQ and GSM's appeal in abeyance pending completion of DEQ's response to the District Court's order.

In 2003, the Montana Legislature again amended the reclamation standards applicable to open pits. Section 82-4-336(9)(b), MCA, requires open pits and rock faces to be reclaimed to a condition:

> (i) of stability structurally competent to withstand geologic and climatic conditions without significant failure that would be a threat to public safety and the environment;
> (ii) that affords some utility to humans or the environment;
> (iii) that mitigates post-reclamation visual contrasts between reclamation lands and adjacent lands; and,
> (iv) that mitigates or prevents undesirable offsite environmental impacts.

Subsection 82-4-336(9)(c), MCA, provides that "[t]he use of backfilling as a reclamation measure is neither required nor prohibited in all cases. A department decision to require any backfill measure must be based on whether and to what extent the backfilling is appropriate under the site-specific circumstances and conditions in order to achieve the standards described in subsection (9)(b)."

In the SEIS, the revised partial pit reclamation plan submitted by GSM was named the Partial Pit Backfill With In-Pit Collection Alternative and was treated as the proposed action alternative. The currently approved reclamation plan (the No Pit Pond Alternative) was treated as the no action alternative. DEQ also considered a Partial Pit Backfill With Downgradient Collection Alternative and an Underground Sump Alternative. DEQ must select the open pit reclamation alternative and mitigation measures to be implemented at GSM based on the reclamation standards as amended by the 2003 Montana Legislature. DEQ's decisions are documented below.

II. Decisions

After considering the proposal, issues, alternatives, potential impacts, and management constraints, DEQ has selected the Underground Sump Alternative which was identified as the preferred alternative in the draft and final SEISs. The Underground Sump Alternative as documented in this ROD is approved for implementation as described in this record.

Mitigation measures to reduce environmental impacts and to improve the potential for long-term reclamation success will be stipulated in Amendment 011 to the operating permit before this decision can be implemented by GSM. This approval is made by DEQ under MMRA. The Underground Sump Alternative is described in detail in Chapter 2 of the SEIS.

III. Amendment 011 Stipulations

The following stipulations will be attached to the operating permit as a part of Amendment 011. All other stipulations previously attached to Operating Permit 00065 remain in full force and effect unless specifically modified in this section of this ROD.

GSM must comply with the stipulations, and the stipulations are enforceable elements of the operating permit.

These stipulations are based on modifications to the Underground Sump Alternative. As explained in the SEIS, these stipulations mitigate specific impacts identified in Chapter 4 of the SEIS. Following each stipulation is a brief rationale for its adoption.

Pit Highwall

Stipulation 011-1 (SEIS Mitigation Measure 1)

When GSM files its next annual report in June of 2008, GSM must submit for DEQ's approval a plan for monitoring and mitigating raveling and sloughing of the pit highwall. Survey prisms currently used to ensure safe mining operations must continue to be used after closure during activities in the pit to monitor ground movement in potentially susceptible areas. A plan concerning entry into the pit after storm events, spring thaws, or after long periods of absence must also be developed and submitted to DEQ for approval two years prior to projected mine closure.

GSM must continue to maintain existing horizontal drains and highwall dewatering wells. GSM must install additional horizontal drains and highwall dewatering wells where necessary to relieve hydrostatic pressure in the highwall and capture groundwater before it enters the pit. GSM must submit plans and obtain DEQ's approval prior to installing the additional horizontal drains and highwall dewater wells.

Rationale: These measures have been proven to be effective during the past 25 plus years of mining at GSM. These plans will help ensure workers' safety and provide for a mechanism to help maintain pit access. The wells will help reduce the amount of pit water that would have to be handled.

Groundwater Effluent Management System

Stipulation 011-2 (SEIS Mitigation Measure 5)

Highwall safety benches, especially the safety bench at elevation 5,700, and safety berms must be maintained to catch rock that ravels and sloughs from the highwall after closure. The pit haul road must be maintained for access. Rock raveling and sloughing from the highwall that escapes the safety benches and berms must be removed from the pit haul road.

Rationale: Maintenance of safety benches, berms, and haul road will ensure that the dewatering system in the pit will be accessible, and worker safety will be ensured.

Stipulation 011-3 (SEIS Mitigation Measure 6)

GSM must install and maintain a remote monitoring system for pumps, pipelines, powerlines, etc., to ensure water is captured efficiently.

A dewatering monitoring system performance program must be implemented to monitor progress of the dewatering, evaluate the effectiveness of the system, and document the volume and quality of water pumped from the underground sump and capture wells.

GSM must submit a plan for the remote monitoring system and the dewatering monitoring system performance program for DEQ's approval when GSM files its next annual report in June of 2008.

Rationale: A remote monitoring system will ensure the proper functioning of the dewatering system while protecting workers by not requiring them to visit dewatering system components frequently. The system performance program will track the efficiency of the dewatering system and identify potential for improvement.

Stipulation 011-4 (SEIS Mitigation Measure 7)

Dewatering wells, pumps, access roads, powerlines, and pipelines must be repaired or replaced as needed to maintain dewatering system operations.

Rationale: Maintaining dewatering system components in good order will protect groundwater quality.

Stipulation 011-5 (SEIS Mitigation Measures 4 and 9)

Underground access will be needed for a primary or contingency pit dewatering system. The agencies expect that the 4,550-foot elevation portal to the underground workings will be buried by rocks raveling off the highwalls and mass failures over time. GSM must develop a secondary portal at a suitable elevation for long-term access. Powerlines, pipelines, and maintenance of access roads to the secondary portal and in underground workings will be needed to ensure integrity of the dewatering system and provide secondary access for workers. GSM must submit plans for the secondary portal to DEQ for approval when GSM files its next annual report in June of 2008.

GSM must submit a monitoring and maintenance plan to ensure continued access to repair the dewatering system and to ensure worker safety. The monitoring and maintenance plan must be applied to both the 4,550-foot and secondary portal locations. Additionally, GSM must monitor the underground workings to ensure the integrity of the walls and ceiling. GSM must submit the monitoring and maintenance plans to DEQ for approval when GSM files its next annual report in June of 2008.

If the 4,550-foot-elevation portal or the secondary portal becomes inaccessible, GSM must establish a third portal.

GSM must submit bond determined by the agencies to be adequate to maintain access to, and regularly repair and replace, dewatering system components.

Rationale: These measures will allow dewatering to continue to keep the water table from rebounding if the primary dewatering system is damaged or destroyed and cannot be reestablished. Secondary portals will provide access to the underground workings, a backup dewatering system, and an escape way for workers.

Storm Water Runon/Runoff Management

Stipulation 011-6 (SEIS Mitigation Measure 10)

Storm water diversions must be monitored regularly for integrity and gradient. If the gradient changes from settling resulting in low spots, the diversion must be returned to the proper gradient, resoiled, and seeded as necessary. From time to time, portions of the diversions may need to be reconstructed completely or have sediment accumulations and/or rockfalls from upgradient slopes removed.

Rationale: The maintenance requirements for the storm water diversions will ensure that the diversions will route water away from the pit area over time.

Soil Cover

Stipulation 011-7 (SEIS Mitigation Measure 11)

This mitigation measure replaces Measure S-1 from the 1997 DEIS, Chapter IV, Section IV.P, which was approved as Stipulation 010-14 in the 1998 ROD.

GSM must implement a program for the continued monitoring of existing waste rock dump complexes and pit surfaces that are reclaimed over acid-producing materials to further assess the impacts, if any, that steam venting may have on reapplied soil or establishing vegetation. The program must consist of GSM and/or agency reclamation specialists annually monitoring the number, location, and size of steam vents and the extent of modified plant communities surrounding vent locations. If detrimental effects to establishing vegetation communities are observed on more than 0.1 percent of the total reclaimed area covering acid-producing materials, GSM must: 1) rock armor vent locations to prevent erosion and spreading of vent locations, 2) sample and test soils at vent locations, and 3) prepare a detailed plan to further reduce the expansion of steam vents and minimize potential impacts to reclamation success. Soil parameters to be tested must correspond to those that appear to have given rise to the change in vegetation communities. At a minimum, soil pH and ABA must be evaluated for each sample collected. The general cost for such a program must be included in a post-mine maintenance bond.

GSM must submit the monitoring program to DEQ for approval when GSM files its next annual report in June of 2008.

Rationale: This will be an effective means of assessing and mitigating the changes occurring, if any, through time to reapplied soil materials and vegetation communities as a result of steam venting. The results of testing will be directly applicable to assessing whether steam venting has a negative effect on establishing vegetation communities.

Stipulation 011-8 (SEIS Mitigation Measure 12)

GSM must monitor any acreage revegetated in the pit for rock raveling and sloughing, erosion, and noxious weeds. Rock that has raveled or sloughed on revegetated areas must be removed or covered with new soil. Areas that have settled must be filled to grade with additional soil. Eroded areas must be repaired, resoiled, and reseeded. Noxious weeds must be controlled.

GSM must submit the monitoring program to DEQ for approval when GSM files its next annual report in June of 2008.

Rationale: This measure will ensure that revegetated areas are maintained, and storm water is diverted out of the pit.

Stipulation 011-9 (SEIS Mitigation Measure 13)

GSM must perform further testing to verify that soil from the proposed borrow site east of Tailings Impoundment No. 2 has the rock size and characteristics that are adequate for use on 2H:1V slopes. An amendment to add rock fragments will be required if necessary.

Rationale: This measure will ensure that soil placed on 2H:1V slopes in the pit would be protected from erosion.

Water Treatment

Stipulation 011-10 (SEIS Mitigation Measure 14)

This is a modification of Measure W-6 from the 1997 DEIS, Chapter IV, Section IV.P, which was approved as Stipulation 010-9 in the 1998 ROD.

The capacity of the permanent water treatment plant must be reevaluated and incorporated into a final design when GSM files its next annual report in June of 2008. At that time, the actual rate and quality of pit inflow during peak flow and low flow periods, and the total rate and quality of groundwater captured in the tailings area will be better known. Based on the degree of uncertainty of the rate of inflow from future sources, a contingency measure of up to 25 percent additional flow must be incorporated into the treatment plant capacity, and a contingency to provide storage for

up to 6 months of anticipated water inflow must be included. This will provide for time to modify the plant for unanticipated future inflows. GSM must submit the final design to DEQ for approval two years prior to the projected mine closure.

Alternatively, a new, additional water treatment facility may be constructed to address treatment of a specific source or sources. This supplemental water treatment facility must be built at the time such sources are identified. This alternative measure may be considered for treatment of waste rock dump Acid Rock Drainage (ARD) because the time frame before ARD impacts are anticipated to occur is longer than a reasonable design life of the permanent water treatment plant that will be built at the end of mining. GSM must submit plans for any additional water treatment facility to DEQ for approval prior to construction.

Rationale: Sufficient additional water treatment capacity, whether added to the permanent water treatment plant design or as an additional separate facility, will provide for treatment of unanticipated inflows.

Impacts to Groundwater Quality and Quantity

Stipulation 011-11 (SEIS Mitigation Measure 16)

Water must be discharged from the permanent water treatment plant back to the aquifer as recharge or discharged as surface water in order to minimize impacts to downgradient beneficial uses.

Rationale: This measure will minimize impacts to beneficial uses of water down gradient of the groundwater capture system in the Jefferson River alluvial aquifer or the Jefferson River and Slough.

Impacts to Surface Water Quality and Quantity

Stipulation 011-12 (SEIS Mitigation Measure 18)

This is a modification of Measure W-1 from the 1997 DEIS, Chapter IV, Section IV.P, which was approved as Stipulation 010-4 in the 1998 ROD.

GSM must establish a monitoring program to quantify discharge and water quality at springs in the project area and to identify any reductions or increases in flow or changes in water quality. Data must be collected often enough to detect spring response to seasonal variations and pit dewatering. GSM must submit plans for the monitoring program to DEQ for approval when GSM files its next annual report in June of 2008.

Mitigation of reduced discharge at springs must be accomplished by further development of the affected spring or by diverting water from the permanent water treatment plant to provide water for wildlife and livestock use. Further development of

the spring must involve improving collection and storage of spring discharge and/or expanding the interception area of the spring at the water table.

If spring discharge increases by more than 15 percent of the baseline spring flow, or if water quality declines, GSM must mitigate. If flow increases or water quality decreases, the spring water must be collected and routed to the water treatment plant for treatment and disposal.

Mitigation of reduced water quality must be accomplished by establishing additional water sources for wildlife and livestock use. Treated water from the permanent water treatment plant must be discharged as surface water for wildlife and livestock use.

Any change in the quantity and/or quality of springs and seeps, and their associated source of contaminants, will be subject to an MPDES permitting review by DEQ. For bonding purposes, the agencies have assumed that one existing spring, Stepan Spring, will have a 15 percent increase in flow that will have to be collected and treated, and that one new spring discharging 1.5 gpm will develop and will be collected and treated under an MPDES permit.

Rationale: This measure will document variations in spring discharge and spring water quality and provide data to determine if changes in spring flows or water quality occur during and after mining. This measure also will provide continued surface water sources at the mine site, reducing impacts to wildlife and livestock.

Stipulation 011-13 (SEIS Mitigation Measure 19)

This is Measure W-4 from the 1997 DEIS, Chapter IV, Section IV.P, which was approved as Stipulation 010-7 in the 1998 ROD.

If the data from existing monitoring wells and/or spring flows indicate that changes in water quality are occurring that are likely to exceed applicable regulatory requirements, the following mitigation measures must be employed:

a) If water quality impacts are detected in monitoring wells at the mixing zone boundary down gradient from the East Waste Rock Dump Complex, localized capture of groundwater may be needed to contain ARD transport along preferential, discrete flow paths that were not anticipated by the ARD fate and transport model (see the 1997 DEIS, Appendix J). A groundwater capture system similar to the system described in the 1997 DEIS, Appendix A for the West Waste Rock Dump Complex must be installed. Capture of discrete plumes from the East Waste Rock Dump Complex would not require a well system as extensive as that needed for the West Waste Rock Dump Complex. The contingency design in the 1997 DEIS, Appendix A that provides for treatment of approximately 20 percent of the predicted flux on the east side is considered adequate for this mitigation measure;

b) ARD-impacted seeps may emerge at the toes of the waste rock dumps where preferential drainage paths occur within the dumps that lead to discrete "perched" saturated zones at their base. GSM must install shallow groundwater capture systems, such as toe drains around the peripheries of the waste rock dumps, to supplement the primary, deep capture well system. GSM must submit the plans for the groundwater capture systems to DEQ for approval prior to installation;

c) In-situ treatment systems must be installed in the shallow ("perched") aquifer zones, including the alluvial materials over bedrock on the west side, and/or the colluvial/alluvial materials in Rattlesnake Gulch or at other locations down gradient of the East Waste Rock Dump Complex. One example of this type of emerging technology is a "funnel and gate" approach, which incorporates groundwater barriers that funnel the identified contaminant plume(s) through constrained location(s) within the shallow aquifer. In-situ reaction walls, such as limestone-filled trenches, are installed at these gate locations. The reaction walls provide essentially "semipervious" barriers that allow water to pass but "filter" the dissolved metals or other contaminants. GSM must submit plans for the in-situ treatment systems to DEQ for approval prior to installation.

Rationale: The supplemental groundwater capture systems described will allow interception of contaminated groundwater that bypasses the primary capture well system. ARD-impacted groundwater could bypass the capture wells along shallow perched flow paths around the peripheries of all the dumps or move through high conductivity preferential flow paths down gradient from the East Waste Rock Dump Complex. The supplemental systems described will provide for capture of these potential ARD sources before the contaminated water migrates down gradient to beneficial uses or to sensitive receptors, such as the Jefferson River.

Safety

Stipulation 011-14 (SEIS Mitigation Measure 20)

A 70-foot-wide safety bench at the 5,700-foot elevation or other location must be left around three sides of the pit for additional protection. The access road leading down to the portals must be widened. GSM must submit plans for the safety bench and access road to DEQ for approval when GSM files its next annual report in June of 2008.

Rationale: This measure will provide additional protection to workers in the pit, but there would continue to be hazards associated with working in the pit.

Aesthetics

Stipulation 011-15 (SEIS Mitigation Measure 21)

About 37 acres in the pit must be treated with the following measures to reduce the visual contrast with adjacent lands, if the work can be accomplished safely:

- *End dumping and/or cast blasting will occur along the upper portion of the northwest and west highwalls, and these areas will be soiled, seeded and planted with trees.*
- *Dozer work will be completed on the area of the west highwall that sloughed in 2005 or a replacement area approved by DEQ, and this area will be soiled, seeded and planted with trees.*
- *Soil sampling on the old slide area on the northwest highwall will be completed, and this area will be seeded and planted with trees.*
- *Soil will be placed on the highwall bench above the 5,700-foot safety bench, and the area will be seeded and planted with trees, if it is safe to do so.*
- *Trees will be planted where possible on the 5,700- and 5,400-foot safety benches.*

Rationale: Sharp lines and forms in the pit will be softened. Pit highwall rock weathering and vegetation over the long term will blend with the color and texture of the natural landscape. Portions of the highwalls and benches will remain visible. Overall visual contrasts will be reduced to a level where they are noticeable but not dominant in the landscape, following successful reclamation and revegetation. Landscape modifications will be consistent with the suggested VRM Class III rating for the area.

Stipulation 011-16 (SEIS Mitigation Measure 22)

The East Waste Rock Dump Complex must be extended back across the mouth of the pit to tie into the natural slope and partially screen the view of the northeast corner of the pit highwall.

Rationale: Views of the northwest portion of the pit highwall will be partially obscured.

Cultural Resource Protection

Stipulation 011-17 (SEIS Mitigation Measure 23)

GSM must prepare and execute a mitigation plan that protects the cabin located near the highwall, if it is threatened by cast blasting.

Rationale: A mitigation plan will ensure that the cabin is protected, or that historical data are properly collected and recorded before it is damaged or destroyed.

Administrative Stipulations

Stipulation 011-18

The current format of the annual report must be expanded to include requirements in the following stipulations:

1. *Storm water diversion inspection and maintenance programs (Stipulation 011-7).*

2. *Monitoring of steam vent number, size, and location and effects of vents on adjacent soils and vegetation (Stipulation 011-8).*

3. *Monitoring of discharge and water quality of springs (Stipulation 011-13).*

Rationale: This administrative requirement is incorporated into the Amendment 011 conditions in order to ensure there is no doubt about what the agencies expect to be included in the annual reports. The need for the specific monitoring requirements is addressed under each of the cross-referenced stipulations.

Stipulation 011-20

When GSM files its next annual report in June of 2008, GSM must submit a revised operating and reclamation plan that reflects all of the changes required in the SEIS and this ROD. The revised document must include appropriate sections in the current operating plan that are currently cross referenced in the Amendment Application.

Rationale: Submittal of an updated consolidated plan will ensure that the permitted plan is clearly spelled out in one document rather than in a number of separate reports and plans, which may not be consistent with each other.

Stipulation 011-21

Wherever in the stipulations GSM is required to develop a study, plan, design, specification, or other document or documentation, that study, plan, design, specification, or other document or documentation must be submitted to DEQ, with copies to the BLM, for approval. Wherever approval is required, this approval requirement means that:

1. *if approval is not granted, the study, plan, design, specification, or other document or documentation may not be implemented, and no action may be undertaken pursuant to the study, plan, design, specification, or other document or documentation, and*

2. *if approval is granted, GSM must conduct its operations in accordance with the study, plan, design, specification, or other document or documentation.*

Rationale: The agencies incorporated this requirement as a stipulation to Amendment 011 based on their experiences with complex plans. This stipulation is intended to clarify which limits will be used by the agencies in determining compliance.

Mitigation Measures Considered but not Stipulated

Mitigation Measures 2, 2a, 3, 8, 15, and 17 from the SEIS all are specific to alternatives not adopted under this decision.

A. Other Rights and Permits

Approval of the permit amendment does not convey or create any real property rights or use rights.

GSM's Storm Water Pollution Prevention Plan was approved under the General Permit for Storm Water Discharge Associated with Mining and Oil and Gas Activities issued February 11, 2003. No changes in this permit result from this decision. The statement of basis for a groundwater mixing zone was incorporated into the operating permit in Amendment 010 through Stipulation 010-6.

GSM holds Air Quality Permit #1689-06, issued June 30, 2001, and must continue to comply with its requirements. No modifications to this permit have resulted from the decision.

GSM is responsible for obtaining any property rights, easements, mineral rights, or water rights necessary to implement the selected alternative. GSM is responsible for obtaining any other local, state, or federal permits, licenses, or reviews that might be necessary to implement the selected alternative.

During implementation of this decision, GSM may propose waivers, exceptions, or modifications to the mining and reclamation plans and associated stipulations or conditions. Such changes could be appropriate to allow the use of alternate mitigation methods that might be developed in the future or to respond to an improved understanding of site conditions gained through operational experience.

Any proposed change to the operating procedures, schedule, reclamation design, or mitigation measures will be reviewed by the agencies and accepted if the change would provide resource protection equal to or greater than the original requirement and would not result in significant impacts not identified in the SEIS. Proposed changes that would not achieve the same level of resource protection, or would result in previously undisclosed significant impacts would require supplemental analysis under MEPA prior to determining their acceptability.

B. Reclamation Bond

GSM is required to post and maintain a reclamation bond in an amount that would enable DEQ to implement the reclamation and other plans as stipulated above and in prior amendments should GSM be unable or unwilling to do so. DEQ has decided to issue this ROD after fifteen days have expired from the date of transmitting the SEIS to the Governor and the Environmental Quality Council pursuant to ARM 17.4.620(5).

This fifteen-day period is an insufficient period of time for DEQ to determine any change in the estimated cost to the state to reclaim the open pit resulting from selection of the Underground Sump Alternative and the mitigation measures set forth in this decision.

Within 60 days of the date of this decision, DEQ will request GSM to submit a bond reflecting any change in the cost to the state to ensure compliance with the Montana Clean Air and Water Quality Acts, the MMRA, administrative rules adopted under the MMRA, and GSM's permit that results from selection of the Underground Sump Alternative and the mitigation measures set forth in this decision. Section 82-4-338(1), MCA, requires GSM to file with DEQ a bond in the sum determined by DEQ.

The bond calculations will be on file and available at DEQ upon request.

V. Issues and Alternatives

The SEIS and this ROD have been prepared in response to GSM's application, the court order, and issues and concerns identified through public comment. Alternatives were developed to address significant issues. These issues and alternatives are summarized below and presented in detail in the SEIS. A preferred alternative was identified in the Draft SEIS and was selected following completion of the Final SEIS. This decision takes into account impacts of the various alternatives as well as public comment and the potential for the alternatives to resolve the issues.

A. Public Scoping and Comment

A Notice of Intent (NOI) to prepare the SEIS was published in the Federal Register on May 7, 2003. The NOI invited scoping comments to be sent to DEQ and BLM through June 7, 2003. On July 1, 2003, a press release was issued to area newspapers, State of Montana Newslinks Service, and major interest groups. A public scoping meeting was held near the mine in Whitehall, Montana, on July 16, 2003. Approximately 165 members of the public attended the meeting and public comments were recorded. As a result of the public scoping process, 75 comment letters were received by DEQ and BLM.

The Draft SEIS was released on February 11, 2005, with the publication of the Notice of Availability in the Federal Register. About 250 copies of the Draft SEIS were distributed to the public and other state and federal agencies with an invitation to comment. The Draft SEIS presented four alternatives, including the no action alternative, the company proposed action, and the agencies' preferred alternative. The Draft SEIS disclosed the affected environment and the environmental consequences of each alternative.

Public meetings were held in Whitehall on January 31, 2005, Helena on March 14, 2005, and Butte on March 24, 2005. The meetings were conducted by DEQ and BLM to solicit input on the Draft SEIS. The public comment period went from December 16, 2004, until April 12, 2005. Up to 16 persons spoke at the public meetings, and 169 comment letters and forms were received.

All written and oral comments were reviewed and considered during preparation of the Final SEIS. Comments that presented new data, questioned facts or analysis, or raised questions or issues bearing directly on the alternatives or environmental analysis received a response in the Final SEIS. Comments expressing personal opinions were considered but received no response.

B. Alternatives Considered in Detail

Chapter 2 of the SEIS describes the alternatives analyzed and the alternatives excluded from detailed analysis. The alternatives listed below were analyzed in detail in Chapter 4 of the SEIS:

- No Pit Pond Alternative (No Action Alternative)
- Partial Pit Backfill With In-Pit Collection Alternative (Proposed Action)
- Partial Pit Backfill With Downgradient Collection Alternative
- Underground Sump Alternative

C. Environmentally Preferred Alternative

The Underground Sump Alternative is the environmentally preferred alternative. Regular pumping of acid rock drainage from the underground sump would maintain the pit as a sink. No impacts to groundwater or surface water outside the pit would be anticipated because impacted groundwater would not flow from the pit. Partially backfilling the pit would better provide for structural stability, utility to humans and the surrounding natural system, and blending in appearance with the surrounding area. However, collection of acid rock drainage from wells located either in the backfill material or down gradient from the backfilled pit would not be sufficient to protect groundwater and surface water quality. The impacts of the No Pit Pond Alternative would be similar to those of the Underground Sump Alternative, but maintenance of the dewatering system and the risks to workers maintaining the dewatering system would be higher.

VI. Rationale for the Decision

A. Rationale for the Selected Alternative

DEQ has selected for permitting the preferred alternative, the Underground Sump Alternative, after considering the potential impacts of all of the alternatives. DEQ recognizes that none of the alternatives, including the selected alternative, completely avoids environmental impact.

Under all alternatives, no highwall failure that would threaten public safety or the environment outside the pit would occur, and some wildlife habitat would be provided. Only the Underground Sump and No Pit Pond alternatives provide adequate assurance that pollution of the Jefferson River alluvial aquifer and surface water in the Jefferson River Slough in violation of water quality laws will not occur. These alternatives would provide almost complete control of pit seepage through evaporation and collection. Sufficient control of pit seepage to protect groundwater and surface water quality cannot be reliably assured under the partial pit backfill alternatives because of the problems associated with drilling and operating wells in the 875 feet of reactive backfill and with effectively capturing seepage within the pit or down gradient of the pit.

With the imposition of the visual mitigations described in Section 4.8.3.2 of the Final SEIS, the Underground Sump and No Pit Pond alternatives mitigate post-reclamation visual contrasts between the pit and adjacent lands.

The Underground Sump Alternative would pose less risk to workers monitoring and operating the water capture system from rock raveling from the highwall than would the No Pit Pond Alternative. Under the No Pit Pond Alternative, the workers would perform these functions while exposed to highwall raveling and sloughing. Under the Underground Sump Alternative, much of the work would be performed underground. The Underground Sump Alternative collection system would require less maintenance than the No Pit Pond Alternative, because it would not be susceptible to damage from rock raveling from the highwall.

B. Selected Alternative Compliance with Legal and Policy Mandates

This section explains how the selected alternative satisfies the agency's statutory, regulatory, and policy mandates.

Metal Mine Reclamation Act

In enacting the Metal Mine Reclamation Act, the Montana Legislature found that it is not practical to extract minerals without disturbing the surface of the earth and without producing waste material and that the very character of many types of mining precluded complete restoration of the land to its original condition. The Montana Legislature found that the reclamation standards set forth in the Metal Mine Reclamation Act allow for exploration and mining of valuable materials while adequately providing for the subsequent beneficial use of the lands to be reclaimed.

In regard to the reclamation of open pits and rock faces, the Montana Legislature has enacted the following reclamation standards set forth in Section 82-4-336, MCA:

> (9)(b) With regard to open pits and rock faces, the reclamation plan must provide sufficient measures for reclamation to a condition:

(i) of stability structurally competent to withstand geologic and climatic conditions without significant failure that would be a threat to public safety or the environment;

(ii) that affords some utility to humans or the environment;

(iii) that mitigates postreclamation visual contrasts between reclamation lands and adjacent lands; and

(iv) that mitigates or prevents undesirable offsite environmental impacts.

(c) The use of backfilling as a reclamation measure is neither required nor prohibited in all cases. A department decision to require any backfill measure must be based on whether and to what extent the backfilling is appropriate under the site-specific circumstances and conditions in order to achieve the standards described in subsection (9)(b).

Under the selected alternative and required permit stipulations, the highwall would be structurally stable, although some sloughing and raveling is expected to occur over time. Due to the geology of the pit, there is little potential for structurally controlled failures of the highwall, except for the upper west and northwest highwalls where raveling and small wedge failures could occur. Physical and chemical weathering are not likely to become a factor in highwall stability. The expected sloughing and raveling will lead to increased stability of the highwall with minimal impact on the environment outside the pit.

Under Stipulation 011-16, approximately 37 acres of pit benches and highwall areas are to be revegetated, providing wildlife habitat. In addition, permit stipulations currently in place require GSM to construct nesting cavities for raptors and bats in the highwalls.

The 37 acres of the highwall to be revegetated under Stipulation 011-16 are visible from transportation corridors. This acreage includes areas of the upper highwall that will be reshaped by end dumping and/or cast blasting and safety benches. The reshaping and/or revegetation of portions of the highwall will soften the sharp lines and forms existing in the upper highwalls. Stipulation 011-17 requires the extension of the East Waste Rock Dump Complex across the mouth of the pit to tie into the natural slope and partially screen the view of the northeast corner of the pit highwall.

Pumping of acid rock drainage under the selected alternative will maintain the pit as a hydrologic sink. No impacts to groundwater or surface water outside the pit would be anticipated because impacted groundwater would not flow from the pit.

The selected alternative achieves the standards described in Section 82-4-336(9)(b), MCA. Therefore, the use of backfilling as a reclamation measure is not appropriate under Section 82-4-336(9)(c), MCA.

The Metal Mine Reclamation Act also requires land disturbed by mining to be reclaimed to a condition that prevents the pollution of water and the degradation of adjacent lands. Section 82-4-336(10), MCA. As will be discussed in the following section, the selected alternative provides almost complete control of pit discharges and, therefore, does not present a risk of violation of the Water Quality Act either in surface water or groundwater outside the pit.

Montana Water Quality Act

The selected alternative provides almost complete control of pit discharges by maintaining the pit water level as close as possible to the 4,525-foot elevation, creating a hydrologic sink. There would be no risk of violation of groundwater standards and beneficial uses in the Jefferson River alluvial aquifer and the Jefferson River Slough from pit seepage.

The alternatives providing for backfill of the pit do not provide sufficient control of pit discharges to assure protection of the Jefferson River alluvial aquifer and the Jefferson River Slough. In addition to the problems associated with drilling and maintaining wells up to 875 feet deep in unconsolidated waste rock required for the Partial Pit Backfill With In-Pit Collection Alternative, the settling of fines may cause reduced permeability in the crusher reject used to create the pumping zone. The reduced permeability may cause the crusher reject to lose its ability to function as a sink to collect pit seepage. Additionally, perched groundwater paths may form in the backfill material, permitting seepage to leave the pit without being captured by the wells. Finally, the low permeability of the backfill material would likely make the control of pit seepage with vertical wells drilled in the backfill unreliable.

Under the Partial Pit Backfill With Downgradient Collection Alternative, DEQ believes that a maximum of 80 percent of groundwater would likely be captured by each of the two capture systems, providing a combined capture efficiency of 92 percent. This capture efficiency would result in violations of water quality standards. DEQ-7 human health water quality standards for nickel and copper would be exceeded within the Jefferson River alluvial aquifer. Nondegradation criteria for groundwater quality in the Jefferson River alluvial aquifer would fail for arsenic, cadmium, copper, iron and nickel. The chronic aquatic life standard for aluminum would be exceeded in the Jefferson River Slough. Nondegradation criteria for surface water quality in the Jefferson River Slough would fail for aluminum, copper and iron.

Montana Pollutant Discharge Elimination System

An MPDES Permit is required for all discharges to surface water or groundwater. GSM holds General Permit for Storm Water Discharge Associated with Mining and Oil and Gas Activities (MTR 300199) issued February 11, 2003. GSM also has an approved Storm Water Pollution Prevention Plan. The statement of basis for a groundwater mixing zone was incorporated into the operating permit in Amendment 010 through Stipulation 010-6.

Clean Air Act of Montana

GSM holds air quality permit #1689-06. Emissions from mining activity have been within ambient air quality standards. Since the level of mining activity will not change under the selected alternative, predicted emission levels will not exceed air quality standards.

Montana Hard Rock Impact Act

The Golden Sunlight Mine was originally permitted before passage of the Hard Rock Impact Act. Thus, GSM is not required to have a Hard Rock Impact Plan.

MEPA Cumulative Effects Assessments

Chapter 4 of the SEIS provides a cumulative effects analysis. There are no related future actions under concurrent consideration, and no reasonably foreseeable future actions, that, when considered in conjunction with past and present actions, are likely to result in additional significant impacts. Should future actions be proposed that have or may have cumulative effects, additional analysis pursuant to the applicable requirements of MEPA would be conducted.

Private Property Assessment Act

Imposition of the Underground Sump Alternative and the stipulations described above does not have taking or damaging implications.

Compliance with the District Court Order

As indicated above, the District Court for the First Judicial District, Lewis and Clark County, ordered DEQ to immediately begin implementation of partial pit backfill in accordance with the procedures set forth in the MMRA. The order was based on the administrative record before the District Court at that time. The Montana Supreme Court currently has jurisdiction of the matter and is holding its appellate review in abeyance until the SEIS was completed and this ROD issued.

DEQ anticipates requesting the Montana Supreme Court to dismiss the appeal or remand the matter to the District Court given the Montana Legislature's amendment of the reclamation standards in 2003 and this decision under the amended reclamation standards. Additionally, DEQ anticipates seeking relief from judgment from the District Court or other appropriate relief based on the further development of the administrative record in the SEIS pursuant to MEPA, including additional impact analysis for partial pit backfill alternatives.

VII. Monitoring and Compliance

This section summarizes the project monitoring that will be conducted. The purpose of monitoring is to ensure compliance with the terms and conditions of the approved mining and reclamation plans, to detect problems early, and to provide a basis for directing remediation of unanticipated problems.

A. Agency Monitoring

Agency staff will continue to conduct compliance inspections at least quarterly under the authority of MMRA. These inspections will be comprehensive mine-wide inspections. Inspections will consist of examination of disturbed areas, verification sampling at water quality monitoring points, and geochemical sampling of mine products, construction materials, and reclamation materials. Revegetation will be examined annually. More frequent inspections could be conducted during periods of intense activity in particular areas of the mine, or when compliance problems have been noted and corrective measures are being implemented. Additional inspections for compliance with the Montana Water Quality Act and the Clean Air Act of Montana will also be conducted. The results of these inspections will be available in agency files.

B. Operator Monitoring Reports

The following monitoring reports are required from GSM under the selected alternative and/or the existing permit. All reports are to be submitted to DEQ and will be available in the agency's files.

Geodetic Monitoring Programs

Monthly reports of monitoring to detect ground movements associated with the landslide blocks and movements associated with the East Waste Rock Dump Complex will be submitted during operations. Data from the monitoring of inclinometers and piezometers will be reported annually. If any movement is detected, the agencies will be notified promptly and monitoring intervals and reporting frequencies increased if needed (Stipulations 010-1 and 010-2 to Operating Permit Amendment 010).

Early warning of plant site movement is being provided by the Rattlesnake and Sunlight Block monitoring in Stipulation 010-1. Weekly and monthly reports on the stability monitoring program for the ore processing facilities are required by the existing permit. Reclamation monitoring after operations will ensure maintenance of cover systems and erosion controls (Stipulation 010-2 to Operating Permit Amendment 010).

Wildlife Mortality

Reports on wildlife mortality at the mine are required. These reports identify species, number, cause of death, and proposed changes to prevent reoccurrence. Summary reports are submitted annually.

Annual Water Resources Monitoring Report

This report is submitted yearly and includes the results of all water resources monitoring specified in the operating plan for the entire year. This report also includes a summary of past annual monitoring results and trend analysis.

Annual Operating and Reclamation Status Report

This is the annual report required by MMRA. The annual report describes overall mining and reclamation status. This report will include GSM's tracking of the status and progress in complying with the agency-imposed stipulations. Under Stipulation 011-19, the format of the annual report must be expanded to include the following:

1. Monitoring of pit highwall raveling and sloughing after closure.

2. Monitoring of the access portals and underground workings after closure.

3. Monitoring of the dewatering system (pumps, pipelines, powerlines, etc.) after closure.

4. Storm water diversion inspection and maintenance programs.

5. Monitoring of steam vent number, size, and location and effects of vents on adjacent soils and vegetation.

6. Monitoring of rock raveling and sloughing, backfill settling, erosion, and noxious weeds on revegetated areas in the pit.

7. Monitoring of discharge and water quality of springs.

VIII. Appeals of DEQ Decisions

Under Montana state law, this record is subject to court appeal by the applicant and other parties for 90 days after issuance of the operating permit amendment. An action alleging failure to comply with the Montana Environmental Policy Act must be brought within 60 days after issuance of the operating permit amendment. An applicant for a permit amendment may request an administrative hearing on a denial of the application within 30 days of written notice of the denial. Notice of permit issuance will be published in the Whitehall Ledger and the Butte Montana Standard.

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Richard H. Opper, Director Date
State of Montana
Department of Environmental Quality